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PERFORMANCE MEASUREMENT INDICATORS

IN THE LIBRARY OF IDRC

A Concept Report

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INTRODUCTION

As a result of observations made by the internal auditors, which were subsequently reflected in their report on Library activities, I was asked by Mr. J.E. Woolston to look into the entire question of performance measurement indicators in the Library and make recommendations as to the applicability of a performance measurement concept in our Library. In so doing, my mandate is within the narrow terms of reference of measurement of activities as they relate to efficiency and effectiveness in the Library.

MODUS OPERANDI

Due to my unfamiliarity with some of the detailed operations of our Library, I requested from the Chief Librarian an organization chart and the position description of every person in the organization. I then proceeded to examine the documents in detail and had a meeting with the Chief Librarian to see if there were any concerns which he had about the question of performance measurement. Through his office, I then arranged to have meetings with the Head of the Acquisitions Section, the Head of the Cataloguing and Indexing Section and the Head of the Reference Section. I then researched the subject of performance measurement as it relates to library operations. Further discussions were then held with various members of the Library and more observations were made as a result of my investigations. I have discussed with the Head of the Serials Section the application of performance measurement as it applies to Serials. Due to the fact that the Serials activity appears to be a microcosm of the entire Library, I have decided to only focus on three major function areas which are - Acquisitions, Cataloguing and Indexing, and the Reference Section. The concept which is discussed and proposed for those three function areas is totally applicable to the Serials Section as well.

CONCEPT OF HAVING PERFORMANCE EVALUATIONS

Evaluation may be carried out in three ways. Firstly, we could have efficiency evaluation which looks at the best method in which we could receive more for our dollar. Secondly, we could have effectiveness evaluation which looks at whether the objectives that have been stated are being met and whether those objectives are well defined. Thirdly, we could look at cost benefit evaluation which relates the cost of

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providing increased services to the marginal benefits of having that service available. In each of these cases, evaluation presupposes the existence of well-defined objectives. In the case of the IDRC Library, for a measurement system to be implemented would require a complete and well-defined set of objectives which are appropriate in relation to the objectives of the Information Sciences Division. Each section of the Library, i.e. Acquisitions, Indexing and Cataloguing, Reference and Serials should all in turn have well-defined sub-objectives which, together, should equal the total objectives of the Library. In turn, each one of these sections should have its goals spelled out, which would indicate how their individual sub-objectives would be met.

Performance measurement is not the answer to a managerial problem in any kind of organization. In the IDRC Library, it will permit a rational technique for decision making and will provide the Librarian with data upon which he or she can make decisions. It will not take the place of the judgmental process of the Librarian or any of the managers. In general, performance measurement simply renders the performance of an organization visible in an imprecise manner by producing quantitative approximations of actual performance to measure change over time. It will not determine whether our Library's objectives are appropriate, or whether they are in line with the objectives of the Information Sciences Division. Nor will it determine if there are alternate means to better achieve the objectives.

MEASUREMENT IN THE IDRC LIBRARY

The question we have to ask is what is the major role of any library, and one comes up with an answer that reads something like this. It is the interface between the universe of bibliographic resources and a particular community of users. Hamburg (1), suggests that the basic objective of the library is exposure of library users to its bibliographic resources. The more exposure that occurs, the better the library performs. This is obviously an oversimplification but it is also a useful one.

It would be safe to assume that the bottom line of the Library at 60 Queen is to provide an information service to a specific clientele. It is therefore important to know how much of the information which sits on our shelves is being used. It would be superficial to develop a measurement system in our Library which specifically only looks at the performance of individual people and does not measure the effectiveness of the entire Library.

This brings us to the matter of measurement criteria. Any type of service activity can be measured on the basis of cost and quality of service. Information services provided by the Library are no exception.

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As a starting point, we might look at the total collection and try to assess how much of that is useful, or potentially valuable, and of that which is useful, how much is used or actually valuable. This will reflect upon how effective we are in acquiring useful books. In the Reference Section, we might find how effective we are in having people use our system of library. Since a few pictures are worth a thousand words, I will emphasize my point by referring you to Figures 1 and 2.

In Figure 1, we depict a diagram showing information which has been collected and which of that is of value. Then we show the total amount of information which is used in relation to our collection and that which is of value.

In Figure 2, we show a less effective organization. Not only is most of the information collected of no value, but all of the use falls outside the sphere of value.

When the Library has determined what information it needs to collect, and if the information contributes towards the IDRC objective, that information is potentially valuable. If the information is then collected and used, the information becomes actually valuable. This is illustrated by Figure 1. The dotted circle represents the total amount of information collected, the dashed circle represents the amount of collected information which is actually used. Potentially valuable information (the solid circle) consists of part of the information currently used, part of the information collected, but not used, and the information which is neither collected nor used. The shaded area represents the intersection of the three circles and indicates the amount of collected information that has actual value. It is evident then from my example in Figure 2 that information that is used had no actual value. Given both the cost of information collection, and the importance of valuable information, we should ask ourselves whether the information collected is much more than that which is used and whether the information which is used is of any value. That last question has a direct bearing on the effectiveness of your Reference Librarian.

Another question we may ask is whether all the information that is collected and used is of value, or is there a large amount of valuable information which is not collected. The converse of that is whether we have so much information collected that very little is of value. This has a direct bearing on the effectiveness of the Acquisitions group.

After determining the unit cost of our holdings, we would be able to cost the value of our unused information. This will be clearly shown in a later discussion on aggregate efficiencies.

In specific terms, we should start by categorizing the different functions in the IDRC Library. For each function we should stipulate which activities are carried out to achieve the objectives of the function.

Figure 1

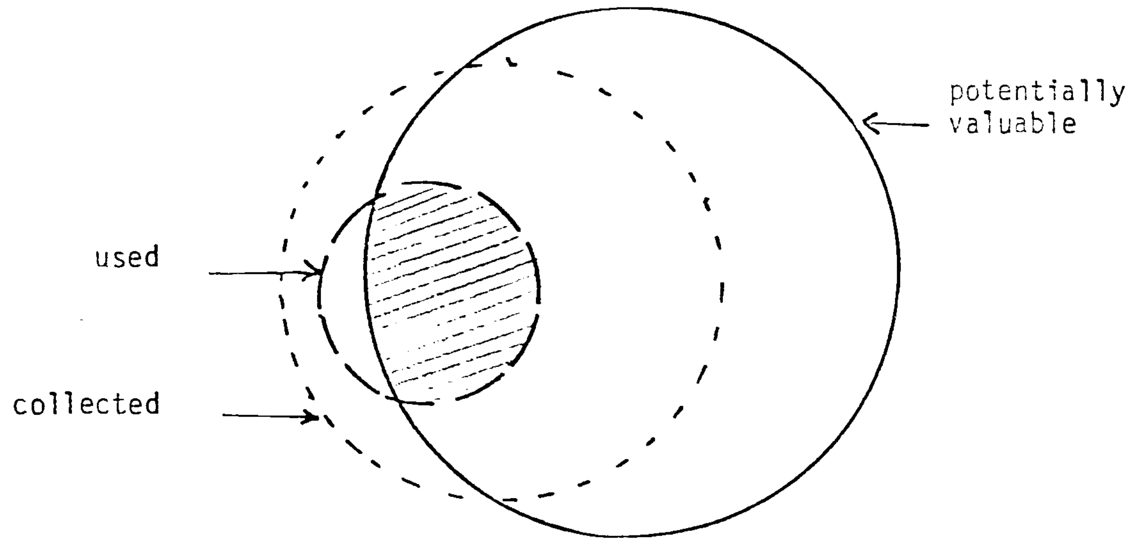
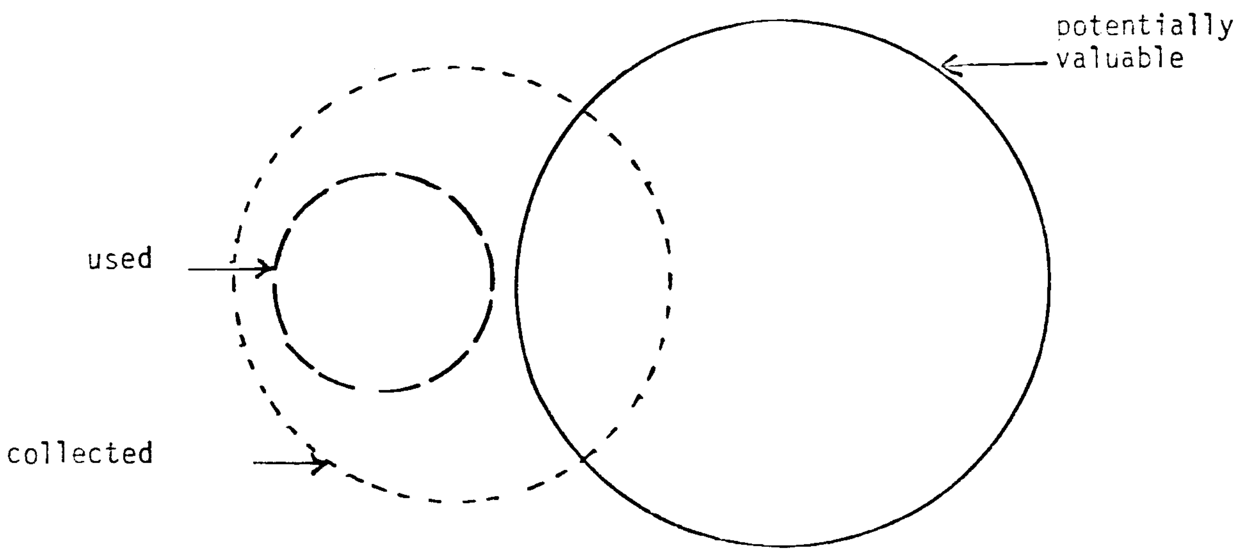


Figure 2



For example, in the Acquisitions Section, we should be able to quantify items ordered, items received and items processed, as well as invoices processed. In the Reference Section, we should be able to list the activities such as directional and reader assistance and information retrieval. In the Indexing and Cataloguing Section, such things as abstracts formulated, titles indexed, worksheets completed, prooflists read could all be quantified in order that we may calculate the aggregate efficiency for each activity. Figures 3 through 5 are a first attempt by the Library section managers to describe the different output of each activity for which they are responsible. Perhaps in some cases shown we may want to group some of the activities into one, or segment some into greater activities. However, for the purpose of this report, what is shown is sufficient to illustrate the arguments I am making. Each of the activities require resources to produce the stated outputs. This will mean therefore that we will be able to calculate what effort is involved to have a book researched, ordered, indexed, catalogued, included into the MINISIS system and shelved. This in turn will enable us to assess the cost of shelved books. It would therefore mean that we would be able to cost the collection in relation to books used. The costs can be calculated using actual material costs plus manpower costs.

MEASURING EFFICIENCY

For each of the activities listed by each function in Figures 3 through 5, we must be able to set an objective target for the period in consideration. For example, if we intend adding 32,000 volumes of a particular year, then we should plan 32,000 volumes for a specific man-year utilization. If we actually added 32,500 volumes for that period of time, then we should look at that as 500 over and above the planned figure against an actual man-year utilization. Using that example, we must be able to assess the planned and actual figure against a standard man utilization. To obtain a standard will be perhaps the most cumbersome task in setting up a measurement system. The Library should start from a base year during which statistics were kept for the activities which are measurable. Some of the statistics have been kept by the three function areas and should be obtainable to calculate man-day figures for each activity. These would then be used as a standard. Where statistics have not been kept, a standard should be developed in a controlled environment over a short period of time.

Standards should be realistic and attainable. The standard should be obtained only with a good amount of effort in order to provide sufficient motivation. On the other hand, unobtainable standards often have a demotivating effect. It is important that the staff concerned in the operation be involved in setting the standards. The purpose of having standards is to compare a measurement against a base-year. It is therefore necessary that a standard unit cost be developed for every

ACQUISITIONS SECTION

ACTIVITY	OUTPUT	MEASURABLE?
1. Receipt of requests for purchase	Approval for purchase	Yes. # approved
	Option for ILL	Yes. # to ILL
	Rejection	Yes. # returned
	Clarification re requirements	No . Time only
	Approval for budgetary allocation other than library (RO, project)	No. Time only
2. Verification	Verification completed	No. Time only.
	New information added to request	No. Time only.
3. Ordering	Purchase orders	Yes. # issued
	Claim notices	Yes. # issued
	Cancellation notices	Yes. # issued
	$ committed	Yes. by allocation
	Items found in collection and sent on loan	Yes. # loaned
	Process (order) file	Yes. Items on orde
	Interviews with publishers' reps	No - time only
	Contacts with suppliers	No - time only
	Consultations with other sections of Library and Centre	No - time only
4. Receiving Solicited (ordered) items Unsolicited (gift or exchange) items	New records for gift or exchange items	Yes. # input
	Modification of records	Yes. # modified.
	Invoices verified for approval	Yes. # approved.
	Actual $ spent	Yes. by allocation
	Items sent to cataloguing/ regional offices/projects	Yes. Items forwarded.
	Process history file	Yes. Printout
	Various other computer printouts	Yes
	Consultation with accounts section	No . Time only
	Correspondence with suppliers	No. Time only

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ACQUISITIONS SECTION - 2

ACTIVITY	OUTPUT	MEASURABLE?
5. Exchange Program	New exchanges proposed	Yes. # letters.
	New exchanges confirmed and added to mailing list	Yes. # added to ML
	Items sent to exchange partners (requests only)	Yes. Items sent.
	Items received from exchange partners	Yes. Items receive
	Subsequent correspondence with exchange partners	No. Time only.

Figure 4

CATALOGUING AND INDEXING SECTION

ACTIVITY	OUTPUT	MEASURABLE?
1. Descriptive cataloguing and indexing of newly acquired materials	Partially completed cataloguing worksheet	Yes. Items indexed
2. Completion of descriptive cataloguing, classification and other related functions (establishing new corporate authors, new series authorities, preparation of shelflist card, etc.) for newly indexed material	Worksheet ready for input; Book ready to be labelled and accessioned; Shelflist card filed	Yes. Items catalogued
3. Labelling of newly catalogued items (from Cataloguing and Indexing) newly arrived issues of serials which bear call numbers (from Serials)	Book labelled and accessioned; is now ready to be circulated or sent to shelves	Yes. Items labelled
4. Editing and production of monthly accessions list	Accessions list	Not really measurable except in time to edit list (2 days / mo.)
5. Initiation of production of COM author, corporate author and title indexer to BIBLIO	Production of one of the three COM indexes every two weeks	No.
6. Building and maintaining the Corporate Name Authority File (CNAF) - verifying and establishing new entries, updating existing records to reflect name changes, new BT/NT relationships, etc. Includes new entries and record changes requested by or resulting from the work of the regional offices, Serials Services and DEVSIS indexers	Up-to-date CORPRAT data base and CNAF indexes	Yes. # records added and/or modified. (Can be very time consuming.)
7. Building and maintaining the Series Authority File (SAF). At present this is a card file from which an EDITOR file has been created; it is updated monthly.	Cards representing new entries and revisions; Paper copies of EDITOR file for indexers, cataloguers and Regional Office libraries are produced monthly	Yes. # new entries and time spent to update EDITOR file

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CATALOGUING AND INDEXING SECTION - 2

	ACTIVITY	OUTPUT	MEASURABLE?
8.	Processing of added copies (usually for Regional Offices), added volumes, new editions	Amended "list all" of record ready for input; book ready to be labelled and accessioned; shelflist card modified	Yes. # items processed
9.	Processing of worksheets representing items catalogued by Regional Offices (at present LARO and ASRO are sending completed worksheets; WARO will begin in a couple of months). (This is related to 6. and 7. as it can involve new entries or modifications for the CNAF or SAF.)	Worksheet ready for direct input; shelflist card filed; new entries to CNAF and/or SAF	Yes. # worksheets processed; # new entries in CNAF and/or SAF
10.	Data base maintenance resulting from organizational changes within the IDRC - e.g. Re-allocation of 161 items returned after the closure of the Quebec office; deletion of Nairobi location for items formerly in WARO	Amended list alls representing modifications to BIBLIO, or direct modification of record; shelflist card modified; books relabelled	Yes. # records modified
11.	Book selection and scanning of periodicals to select material for acquisition by the library	Photocopy of article to be added to data base; completed purchase request form	Yes. # items selected (better measure would be time spent on this function
12.	Reference duty; searching data base in response to requests by patrons	Responses to reference queries - verbal, written, printouts of searches, etc.	Yes. As this is a minor function of Cataloguing and Indexing, it would be best to include # queries answered, etc. with Reference Services statistics and include time only here
13.	Building and maintaining the OB data base	An up-to-date listing of all organizations about which material is located in the OB collection	Yes. # records in OB data base

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CATALOGUING AND INDEXING SECTION - 3

	ACTIVITY	OUTPUT	MEASURABLE?
14.	Macrothesaurus interpretation and maintenance - meetings to discuss the interpretation of descriptors; preparation of additions and changes to the Macrothesaurus; changes to records resulting from these additions and changes	Decisions on the interpretation of descriptors; preparation of lists of additions and changes	Only in time spent on discussion and in updating thesaur and data base
15.	Participation in discussions regarding both the policy and procedures of the Cataloguing and Indexing Services and those of the Library as a whole	Documentation of those decisions which affect the Cataloguing and Indexing Services	Only in time
16.	Preparation and maintenance of an up-to-date cataloguing manual	Periodic updates to the Cataloguing Manual reflecting current procedures	Only in time
17.	Participation in the annual inventory (shelf-reading) and the resulting shelflist changes, relabelling and changes to the data base	Modifications to shelflist, data base and books	Yes. # modifications.
18.	Training of visitors in cataloguing and indexing	Individuals with a knowledge of cataloguing and indexing principles and their application in the IDRC library	No. Only in time.
19.	Assigning call numbers to selected items in the SERIALS portion of the IDRC data base	Shelflist card call number which is entered in SERIAL record	Yes. # items classified for SERIALS
20.	Gathering of statistics	Monthly summary of items catalogued, indexed, input, size of backlog, time spent in special projects, etc.	No.

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Figure 5

REFERENCE SECTION

ACTIVITY	OUTPUT	MEASURABLE?
1. Response to a question for a specific piece of information	Information	User satisfaction
2. Guidance in use of the library and its services		User satisfaction
3. Provision of a bibliography designed for a specific need	Information	User satisfaction
4. Provision of ongoing subject awareness	Information	User satisfaction
5. Publicizing of library services		Increased usage of library services

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activity which is being measured. These activities should show a standard for man-year utilization against each specific output. The standard, which is being developed from a base year, must be shown as equalling 100%. It is possible to set a goal of plus or minus 100%. What is important is the variance of actual against the planned. The object of the exercise is not to see how much or how little an individual has done, but how efficiently the organization has carried out a particular operation. The variance of actual against planned may not be due to an individual, but could be due to some bottleneck in the system. The variance will provide an opportunity for investigation. Figure 6 illustrates the above example. Here, even though the output for volumes added has increased, the aggregate efficiency shows a large decrease. This is because of the 33% increase in man-year utilization. It should be noted that a planned efficiency aggregate was less than 100% (96.96). This shows that one can plan for a less productive period for one activity especially where a learning curve is involved. In the worksheets processed example, the actual output shows a decrease. However, the efficiency aggregate shows an increase. This is due to the much smaller reduction in actual man-year utilization in proportion to the decrease in output.

MEASURING EFFECTIVENESS

The measurement of the cost criteria is perhaps the simplest of all. However, when we get into the qualitative measures of success as applied to our Library, we have to ask the two following questions: (1) Do the users of the Library receive what they want or not? (2) How completely and/or accurately do they receive it?

The first question is also very simple and is of a quantitative nature. The second is much more difficult to apply in practice because it implies both a human value judgement and the use of some graduated scale to reflect degree of success. The second type of measure is necessary however in the evaluation of acquisitions, reference and information retrieval activity.

First of all, we need to measure the holdings of our Library to ascertain whether the holdings are of value to the needs of the clients. We have to find some method of measuring the value of our holdings and then find out which of those holdings which are of value are available to the client at the time that he makes his demand. A number of studies have been done over the years, to come up with a method of measuring the performance rate of a library. By performance rate, I mean the holdings rate and the availability rate. One method used by most public libraries is the De Prospo (2) method. Unfortunately, this method could not be used in our Library since the IDRC Library is very specialized. The De Prospo method will provide artificially low holding rates and artificially high availability rates. The method developed by De Prospo takes 500 randomly selected titles drawn from the American Book Publishing

Figure 6

OUTPUT DESCRIPTION	Output Volume Cumulative by quarter		Aggregate Efficiency		MY Utilization		KEY INDICATORS % of Change in		
	Planned	Actual	Planned	Actual	Planned	Actual	Vol.	Aggr.	Utilization
Volumes Added	32 000	32 500	96.96	73.86	.9	1.2	(1.6)	24	(33)
Worksheets Processed	50 000	39 000	102.27	145.04	2.0	1.1	22	(41.8)	45
	B	B^1	C	C^1	A	A^1			

The above illustrates the example given. For purposes of this illustration the base year standard for volumes added is .006 M.D. and for worksheets processed is .009 M.D.

The equation to obtain the aggregate efficiency would be $\frac{D}{A} \times 100$

where $D = E \times B$

where E = unit cost of base year

B = output

A = man-year utilization expressed in man-days (x 220)

Record for the five latest years. These are then checked against those titles of one's own catalogue to determine the percentage held. Thus, if one discovers 200 of the 500 Book Publishing Record holdings, then the holding rate is alleged to be 40 percent. To determine the availability rate, the De Prospo method takes the titles actually held among the 500 titles of the BPR sample and makes a shelf check to determine what percentage of actual holdings are then available on the shelves.

In his review article, (3) Michael Bommer states that the De Prospo method of measuring availability rates will very likely yield artificially high results. This is because the classic inventory phenomena of a library where one commonly finds that only 20 percent of the items in a given inventory (books or anything else) will receive 80 percent of total demand while the other 80 percent of the inventory items satisfy only 20 percent of the demand. Thus, 80 percent of the BPR sample of De Prospo is likely to be in very low demand and the majority of those books will be on the shelves when wanted. Of the remaining 20 percent of high demand titles, half or more of them are likely to be off the shelves. But the overall availability rate is so heavily biased by the 80 percent portion of low demand titles that it will probably work out to around 70 percent even if no systematic duplication program exists.

As an alternative, in order to ascertain the effectiveness of the IDRC Library, it is possible to develop an annual survey to look at what percentage of our collection meets the user needs and whether the user requests are available in our collection. One way to determine precisely the holding rate is to develop an annual survey among our clients to ascertain whether the title requested is within our collection. This will determine the holding rate.

To determine the availability rate, a survey should be designed that would seek to ask whether a title in our collection has been found on the shelves. While this is a very cheap method, and perhaps not have too much scientific validity, it nonetheless will be a very good thermometer with a considerable amount of managerial usefulness. It will enable management to make concrete decisions about the deficiencies in the availability rate and whether additional copies or duplicates should be made of the holdings or titles, and whether too much investment is being made in titles which are not being used, or whether additional investments should be made to obtain those titles which were requested but not in the collection. I therefore feel that the only way one can really measure holdings and availability rates are those which are applied directly to the actual users. The exact design of the survey at this time is not relevant. What is more relevant is the concept that I am espousing - the concept of applying an annual survey directly with the user to gauge whether the holding or our collection is useful and how much of that which is useful is used. It is a concept which has been done before and which is not difficult to design and implement. It could be done through a general survey throughout the Centre to measure people's past experiences with our Library.

To ascertain the availability rate, we could survey every person actually entering the Library and ask them to complete a form which states the index or catalogue number that was not found on the shelves.

Our Reference Librarian will be the focal point of ascertaining whether information or titles of value requested are not contained in our holdings. This will give us an indication as to how much of the valuable holdings for our specific kind of library is outside of our holdings. A record could be kept of each request which is made to us but that is not in the collection, as a gauge that management would use to measure the acquisitions policy.

CONCLUSIONS

The concept of implementing a performance measurement system in the Library is feasible. All the function areas should have their sub-objectives defined so as to ensure that they all contribute towards the total library objective. The success of the Library can only be measured if there is a complete understanding of what the Library's objectives are. Its sub-objectives should be fairly well described and understood, and its activities should be broken down and described for the purposes of efficiency evaluation.

The efficiency evaluation system as was explained will be able to provide management a good idea of how the resources are being used and it will enable library management to assess the impact of any variance of actual versus planned outputs for any of its activities. As a by-product of this system, it will be possible to cost out the collection by using material costs plus man-year utilization for processing.

Reports on aggregate efficiencies should be done quarterly and should therefore be part of a planning system which shows quantity resource requirements.

The effectiveness evaluation should be done as an annual survey. Because of its impact on library resources, the survey should not be done more than once a year. It will require a considerable amount of effort to design and implement a survey and, therefore, should be done with an extreme amount of care.

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